We claim:

1. A medical device comprising a substrate comprising a passivating coating comprising keratin, said passivating coating being effective to increase bone matrix formation exhibited by cultured 2T3 mouse osteoblasts cells.

2. The medical device of claim 1 selected from the group consisting of tissue engineering constructs, orthopedic implants, dental implants, and ventricular assist devices.

3. The medical device of claim 1 comprising a medical implant.

4. The medical device of claim 3 wherein said substrate comprises a biocompatible material.

5. The medical device of claim 4 wherein the biocompatible material is selected from the group consisting of metals, metal alloys, and ceramics.

6. The medical device of claim 5 wherein said biocompatible material is selected from the group consisting of titanium and hydroxyapatite.

7. The medical device of claim 1 wherein said passivating coating comprises keratin and one or more bioactive factors selected from the group consisting of bone morphogenetic protein (BMP) and transforming growth factor beta (TGF-ß).

8. The medical device of claim 2 wherein said passivating coating comprises keratin and one or more bioactive factors selected from the group consisting of bone morphogenetic protein (BMP) and transforming growth factor beta (TGF-ß).

9. The medical device of claim 3 wherein said passivating coating comprises keratin and one or more bioactive factors selected from the group consisting of bone morphogenetic protein (BMP) and transforming growth factor beta ((TGF-ß)).

10. The medical device of claim 1 wherein said keratin is derived from a material selected from the group consisting of hair, fur, feathers, horns, hooves, beaks, and feet.

11. The medical device of claim 3 wherein said keratin is derived from a material selected from the group consisting of hair, fur, feathers, horns, hooves, beaks, and feet.

12. The medical device of claim 9 wherein said keratin is derived from a material selected from the group consisting of hair, fur, feathers, horns, hooves, beaks, and feet.

13. The medical device of claim 1 wherein said keratin is derived from hair.

14. The medical device of claim 3 wherein said keratin is derived from hair.

15. The medical device of claim 9 wherein said keratin is derived from hair.

16. The medical device of claim 1 wherein said keratin is human hair keratin.

17. The medical device of claim 3 wherein said keratin is human hair keratin.

18. The medical device of claim 9 wherein said keratin is human hair keratin.

19. The medical device of claim 1 wherein said keratin comprises reduced keratin.

20. The medical device of claim 3 wherein said keratin comprises reduced keratin.

21. The medical device of claim 9 wherein said keratin comprises reduced keratin.

22. The medical device of claim 17 wherein said keratin comprises reduced keratin.

23. The medical device of claim 18 wherein said keratin comprises reduced keratin.

24. The medical device of claim 1 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

25. The medical device of claim 3 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

26. The medical device of claim 9 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

27. The medical device of claim 18 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

28. The medical device of claim 23 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

29. The medical device of claim 1 wherein said passivating coating is effective to accelerate bone matrix formation by cultured 2T3 mouse osteoblasts.

30. The medical device of claim 3 wherein said passivating coating is effective to accelerate bone matrix formation by cultured 2T3 mouse osteoblasts.

31. The medical device of claim 9 wherein said passivating coating is effective to accelerate bone matrix formation by cultured 2T3 mouse osteoblasts.

32. The medical device of claim 23 wherein said passivating coating is effective to accelerate bone matrix formation by cultured 2T3 mouse osteoblasts.

33. The medical device of claim 28 wherein said passivating coating is effective to accelerate bone matrix formation by cultured 2T3 mouse osteoblasts.

34. A medical implant comprising:

a substrate comprising a passivating coating comprising keratin, said passivating coating being effective to increase bone matrix formation by cultured 2T3 mouse osteoblasts, said passivating coating comprising a bonding region and a bioactive region;

said bonding region comprising at least one organosilane compound comprising a silane component bound to a surface of said substrate; and

said bioactive region comprising an organic component of said organosilane bound to a reactive pendant group on said keratin.

35. The medical implant of claim 34 wherein said silane component of said organosilane compound is covalently bonded with a surface of the substrate.

36. The medical implant of claim 34 wherein said bioactive region comprises reactive pendant groups on said keratin covalently bonded to said organic component of said organosilane.

37. The medical implant of claim 35 wherein said bioactive region comprises reactive pendant groups on said keratin covalently bonded to said organic component of said organosilane.

38. The medical implant of claim 34 wherein said passivating coating comprises keratin and one or more bioactive factors selected from the group consisting of bone morphogenetic protein (BMP) and transforming growth factor beta ((TGF-ß).

39. The medical implant of claim 35 wherein said passivating coating comprises keratin and one or more bioactive factors selected from the group consisting of bone morphogenetic protein (BMP) and transforming growth factor beta ((TGF-ß).

40. The medical implant of claim 36 wherein said passivating coating comprises keratin and one or more bioactive factors selected from the group consisting of bone morphogenetic protein (BMP) and transforming growth factor beta ((TGF-ß).

41. The medical implant of claim 37 wherein said passivating coating comprises keratin and one or more bioactive factors selected from the group consisting of bone morphogenetic protein (BMP) and transforming growth factor beta ((TGF-ß).

42. The medical implant of claim 34 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, amine groups, isocyanate groups, and carboxyl groups.

43. The medical implant of claim 34 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, and amine groups.

44. The medical implant of claim 43 wherein said amine groups are alkylamine groups.

45. The medical implant of claim 34 wherein said organic component comprises a moiety selected from the group consisting of vinyl groups and epoxy groups.

46. The medical implant of claim 36 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, amine groups, isocyanate groups, and carboxyl groups.

47. The medical implant of claim 36 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, and amine groups.

48. The medical implant of claim 51 wherein said amine groups are alkylamine groups.

49. The medical implant of claim 36 wherein said organic component comprises a moiety selected from the group consisting of vinyl groups and epoxy groups.

50. The medical implant of claim 37 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, amine groups, isocyanate groups, and carboxyl groups.

51. The medical implant of claim 37 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, and amine groups.

52. The medical implant of claim 55 wherein said amine groups are alkylamine groups.

53. The medical implant of claim 37 wherein said organic component comprises a moiety selected from the group consisting of vinyl groups and epoxy groups.

54. The medical implant of claim 41 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, amine groups, isocyanate groups, and carboxyl groups.

55. The medical implant of claim 41 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, and amine groups.

56. The medical implant of claim 59 wherein said amine groups are alkylamine groups.

57. The medical implant of claim 41 wherein said organic component comprises a moiety selected from the group consisting of vinyl groups and epoxy groups.

58. The medical implant of claim 34 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

59. The medical implant of claim 36 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

60. The medical implant of claim 37 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

61. The medical implant of claim 41 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

62. The medical implant of claim 54 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

63. The medical implant of claim 57 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

64. The medical implant of claim 34 wherein said passivating coating is effective to accelerate bone matrix formation in cultured 2T3 mouse osteoblasts.

65. The medical implant of claim 36 wherein said passivating coating is effective to accelerate bone matrix formation in cultured 2T3 mouse osteoblasts.

66. The medical implant of claim 37 wherein said passivating coating is 2 effective to accelerate bone matrix formation in cultured 2T3 mouse osteoblasts.

67. The medical implant of claim 41 wherein said passivating coating is 2 effective to accelerate bone matrix formation in cultured 2T3 mouse osteoblasts.

68. The medical implant of claim 54 wherein said passivating coating is effective to accelerate bone matrix formation in cultured 2T3 mouse osteoblasts.

69. The medical implant of claim 57 wherein said passivating coating is effective to accelerate bone matrix formation in cultured 2T3 mouse osteoblasts.

70. The medical implant of claim 63 wherein said passivating coating is effective to accelerate bone matrix formation in cultured 2T3 mouse osteoblasts.

71. The medical implant of claim 34 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

72. The medical implant of claim 36 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

73. The medical implant of claim 37 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

74. The medical implant of claim 51 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

75. The medical implant of claim 54 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

76. The medical implant of claim 57 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

77. The medical implant of claim 63 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

78. The medical implant of claim 70 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

79. A medical implant comprising:

a substrate comprising a biocompatible material selected from the group consisting of metals, metal alloys, and ceramics;

a passivating coating on said substrate comprising HMWK keratin and one or more bioactive factors selected from the group consisting of bone morphogenetic protein (BMP) and transforming growth factor beta ((TGF-ß), said passivating coating being effective to increase bone matrix formation by cultured 2T3 mouse

osteoblasts said passivating coating comprising an organosilane compound comprising a silane component and an organic component, said passivating coating comprising a bonding region and a bioactive region;

said bonding region comprising said silane component covalently bound to a surface of said substrate; and

said bioactive region comprising said organic component covalently bound to a reactive pendant group on said keratin.

80. The medical implant of claim 79 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, amine groups, isocyanate groups, and carboxyl groups.

81. The medical implant of claim 79 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, and amine groups.

82. The medical implant of claim 81 wherein said amine groups are alkylamine groups.

83. The medical implant of claim 79 wherein said organic component comprises a moiety selected from the group consisting of vinyl groups and epoxy groups.

84. The medical implant of claim 79 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

85. The medical implant of claim 80 wherein said organosilane comprises 2 substituents selected from the group consisting of from about 1 to 3 halogens and 3 from about 1 to 3 alkoxy groups.

86. The medical implant of claim 81 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

87. The medical implant of claim 82 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

88. The medical implant of claim 83 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

89. The medical implant of claim 79 wherein the medical implant is selected from the group consisting of a issue engineering construct, an orthopedic implant, a dental implant, and a ventricular assist device.

90. The medical implant of claim 79 wherein said biocompatible material is selected from the group consisting of titanium and hydroxyapatite.

91. A medical implant comprising:

a substrate comprising titanium;

a passivating coating on said substrate comprising HMWK keratin and one or more bioactive factors selected from the group consisting of bone morphogenetic protein (BMP) and transforming growth factor beta ((TGF-ß), said passivating coating being effective to increase bone matrix formation by cultured 2T3 mouse osteoblasts said passivating coating comprising an organosilane compound comprising a silane component and an organic component, said passivating coating comprising a bonding region and a bioactive region;

said bonding region comprising said silane component covalently bound to a surface of said substrate; and

said bioactive region comprising said organic component covalently bound to a reactive pendant group on said keratin.

92. The medical implant of claim 91 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, amine groups, isocyanate groups, and carboxyl groups.

93. The medical implant of claim 91 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, and amine groups.

94. The medical implant of claim 93 wherein said amine groups are alkylamine groups.

95. The medical implant of claim 91 wherein said organic component comprises a moiety selected from the group consisting of vinyl groups and epoxy groups.

96. The medical implant of claim 91 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

97. The medical implant of claim 92 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

98. The medical implant of claim 93 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

99. The medical implant of claim 94 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

100. The medical implant of claim 95 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

101. The medical implant of claim 100 wherein said halogen is chlorine.

102. The medical implant of claim 101 wherein the medical implant is selected from the group consisting of a issue engineering construct, an orthopedic implant, a dental implant, and a ventricular assist devices.

103. A method of coating a medical device with a passivating coating, said method comprising:

bonding a coupling agent to one or more surfaces of said medical device, producing a bonding region; and,

bonding keratin to said bonding region.

104. The method of claim 103 further comprising cleaning said one or more surfaces before bonding said coupling agent to said one or more surfaces.

105. The method of claim 103 further comprising oxidizing said one or 2 more surfaces before bonding said coupling agent to said one or more surfaces.

106. The method of claim 104 further comprising oxidizing said one or more surfaces before bonding said coupling agent to said one or more surfaces.

107. The method of claim 104 wherein said cleaning comprises sonicating said one or more surfaces in first anhydrous solvent and sonicating said one or more surfaces in water.

108. The method of claim 107 wherein said first anhydrous solvent is selected from the group consisting of methanol, ethanol, isopropyl alcohol, dimethylsulfoxide, acetone, or tetrahydrofuran.

109. The method of claim 107 wherein said first anhydrous solvent is dichloromethane.

110. The method of claim 106 wherein said cleaning comprises sonicating in said one or more surfaces in first anhydrous solvent and sonicating said one or more surfaces in water.

111. The method of claim 110 wherein said first anhydrous solvent is selected from the group consisting of methanol, ethanol, isopropyl alcohol, dimethylsulfoxide, acetone, or tetrahydrofuran.

112. The method of claim 110 wherein said first anhydrous solvent is dichloromethane.

113. The method of claim 110 wherein said water is deionized water.

114. The method of claim 112 wherein said water is deionized water.

115. The method of claim 103 wherein bonding keratin to said bonding region comprises:

dissolving keratin in a solvent; and

adding second anhydrous solvent to produce a keratin mixture;

exposing said bonding region to said keratin mixture, producing a keratin coated bonding region; and

curing said keratin coated bonding region under conditions effective to produce said bioactive region.

116. The method of claim 106 wherein bonding keratin to said bonding region comprises:

dissolving keratin in a solvent; and

adding second anhydrous solvent to produce a keratin mixture;

exposing said bonding region to said keratin mixture, producing a keratin coated bonding region; and

curing said keratin coated bonding region under conditions effective to produce said bioactive region.

117. The method of claim 110 wherein bonding keratin to said bonding region comprises:

dissolving keratin in a solvent; and

adding second anhydrous solvent to produce a keratin mixture;

exposing said bonding region to said keratin mixture, producing a keratin coated bonding region; and

curing said keratin coated bonding region under conditions effective to produce said bioactive region.

118. The method of claim 111 wherein bonding keratin to said bonding region comprises:

dissolving keratin in a solvent; and

adding second anhydrous solvent to produce a keratin mixture;

exposing said bonding region to said keratin mixture, producing a keratin coated bonding region; and

curing said keratin coated bonding region under conditions effective to produce said bioactive region.

119. The method of claim 112 wherein bonding keratin to said bonding region comprises:

dissolving keratin in a solvent; and

adding second anhydrous solvent to produce a keratin mixture;

exposing said bonding region to said keratin mixture, producing a keratin coated bonding region; and

curing said keratin coated bonding region under conditions effective to produce said bioactive region.

120. The method of claim 103 wherein, when said keratin is reduced/reduced keratin, said solvent is water.

121. The method of claim 103 wherein, when said keratin is oxidized/reduced keratin, said solvent comprises an aqueous solution comprising a base.

122. The method of claim 121 wherein said base is selected from the group consisting of ammonium hydroxide, sodium hydroxide, potassium hydroxide, and combinations thereof.

123. The method of claim 122 wherein said base is ammonium hydroxide.

124. The method of claim 115 wherein said second anhydrous solvent is selected from the group consisting of methanol, ethanol, isopropyl alcohol, dimethylsulfoxide, acetone, and tetrahydrofuran.

125. The method of claim 115 wherein said second anhydrous solvent is dimethylsulfoxide.

126. The method of claim 116 wherein said second anhydrous solvent is selected from the group consisting of methanol, ethanol, isopropyl alcohol, dimethylsulfoxide, acetone, and tetrahydrofuran.

127. The method of claim 116 wherein said second anhydrous solvent is @dimethylsulfoxide.

128. The method of claim 117 wherein said second anhydrous solvent is selected from the group consisting of methanol, ethanol, isopropyl alcohol, @dimethylsulfoxide, acetone, and tetrahydrofuran.

129. The method of claim 117 wherein said second anhydrous solvent is @dimethylsulfoxide.

130. The method of claim 118 wherein said second anhydrous solvent is @selected from the group consisting of methanol, ethanol, isopropyl alcohol, dimethylsulfoxide, acetone, and tetrahydrofuran.

131. The method of claim 118 wherein said second anhydrous solvent is dimethylsulfoxide.

132. The method of claim 119 wherein said second anhydrous solvent is @selected from the group consisting of methanol, ethanol, isopropyl alcohol, @dimethylsulfoxide, acetone, and tetrahydrofuran.

133. The method of claim 119 wherein said second anhydrous solvent is dimethylsulfoxide.

134. The method of claim 120 wherein said second anhydrous solvent is @selected from the group consisting of methanol, ethanol, isopropyl alcohol, @dimethylsulfoxide, acetone, and tetrahydrofuran.

135. The method of claim 120 wherein said second anhydrous solvent is @dimethylsulfoxide.

136. The method of claim 121 wherein said second anhydrous solvent is selected from the group consisting of methanol, ethanol, isopropyl alcohol, @dimethylsulfoxide, acetone, and tetrahydrofuran.

137. The method of claim 121 wherein said second anhydrous solvent is dimethylsulfoxide.

138. The method of claim 115 further comprising mixing the keratin mixture with an activation agent selected from the group consisting of a catalyst and @an initiator.

139. The method of claim 138 wherein said activation agent is a vinyl-functional silane and said activation agent is effective to generate free radicals.

140. The method of claim 138 wherein said activation agent comprises an @anthraquinone-2-sulfonic acid.

141. The method of claim 116 further comprising mixing the keratin mixture with an activation agent selected from the group consisting of a catalyst and @an initiator.

142. The method of claim 141 wherein said activation agent is a vinyl-functional silane and said activation agent is effective to generate free radicals.

143. The method of claim 141 wherein said activation agent comprises an @anthraquinone-2-sulfonic acid.

144. The method of claim 119 further comprising mixing the keratin mixture with an activation agent selected from the group consisting of a catalyst and @an initiator.

145. The method of claim 119 wherein said activation agent is a vinyl-functional silane and said reagent is effective to generate free radicals.

146. The method of claim 145 wherein said activation agent comprises an anthraquinone-2-sulfonic acid.

147. The method of claim 115 wherein said conditions comprises exposing said keratin coated bonding region to an energy source for a period of time effective @to produce said bioactive region.

148. The method of claim 119 wherein said conditions comprises exposing said keratin coated bonding region to an energy source for a period of time effective @to produce said bioactive region.

149. The method of claim 146 wherein said conditions comprises exposing said keratin coated bonding region to an energy source for a period of time effective @to produce said bioactive region.

150. The method of claim 147 wherein said conditions comprises exposing said keratin coated bonding region to an energy source for a period of time effective @to produce said bioactive region.

151. The method of claim 146 wherein said conditions comprise the presence of said activation agent.

152. The method of claim 150 wherein said conditions comprise the presence of said activation agent.

153. The method of claim 149 wherein said period of time is from about 1 to about 24 hours

154. The method of claim 150 wherein said period of time is from about 1 to about 24 hours

155. The method of claim 151 wherein said period of time is from about 1 to about 24 hours

156. The method of claim 152 wherein said period of time is from about 1 to about 24 hours

157. The method of claim 149 wherein said period of time is about 24 @hours.

158. The method of claim 150 wherein said period of time is about 24 @hours.

159. The method of claim 151 wherein said period of time is about 24 @hours.

160. The method of claim 152 wherein said period of time is about 24 @hours.

161. A medical implant comprising:

@a substrate comprising a passivating coating comprising keratin, said @passivating coating comprising a bonding region and a bioactive @region;

@said bonding region comprising at least one organosilane compound @comprising a silane component bound to a surface of said substrate;

and

@said bioactive region comprising an organic component of said organosilane @bound to a reactive pendant group on said keratin.

162. The medical implant of claim 161 wherein said silane component of said organosilane compound is covalently bonded with a surface of the substrate.

163. The medical implant of claim 161 wherein said bioactive region comprises reactive pendant groups on said keratin covalently bonded to said organic component of said organosilane.

164. The medical implant of claim 162 wherein said bioactive region comprises reactive pendant groups on said keratin covalently bonded to said organic component of said organosilane.

165. The medical implant of claim 161 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, amine groups, isocyanate groups, and carboxyl groups.

166. The medical implant of claim 161 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, and amine groups.

167. The medical implant of claim 166 wherein said amine groups are alkylamine groups.

168. The medical implant of claim 162 wherein said organic component 2 comprises a moiety selected from the group consisting of vinyl groups and epoxy groups.

169. The medical implant of claim 163 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, amine groups, isocyanate groups, and carboxyl groups.

170. The medical implant of claim 163 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, and amine groups.

171. The medical implant of claim 170 wherein said amine groups are alkylamine groups.

172. The medical implant of claim 163 wherein said organic component comprises a moiety selected from the group consisting of vinyl groups and epoxy groups.

173. The medical implant of claim 164 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, amine groups, isocyanate groups, and carboxyl groups.

174. The medical implant of claim 164 wherein said organic component of said organosilane comprises a moiety selected from the group consisting of epoxy groups, alkoxy groups, vinyl groups, and amine groups.

175. The medical implant of claim 174 wherein said amine groups are alkylamine groups.

176. The medical implant of claim 174 wherein said organic component comprises a moiety selected from the group consisting of vinyl groups and epoxy groups.

177. The medical implant of claim 161 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

178. The medical implant of claim 162 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

179. The medical implant of claim 163 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

180. The medical implant of claim 169 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

181. The medical implant of claim 170 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

182. The medical implant of claim 171 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

183. The medical implant of claim 172 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

184. The medical implant of claim 175 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

185. The medical implant of claim 176 wherein said organosilane comprises substituents selected from the group consisting of from about 1 to 3 halogens and from about 1 to 3 alkoxy groups.

186. The medical implant of claim 161 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

187. The medical implant of claim 162 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

188. The medical implant of claim 163 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

189. The medical implant of claim 169 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

190. The medical implant of claim 170 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

191. The medical implant of claim 171 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

192. The medical implant of claim 172 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

193. The medical implant of claim 175 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

194. The medical implant of claim 177 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

195. The medical implant of claim 178 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

196. The medical implant of claim 182 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

197. The medical implant of claim 183 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

198. The medical implant of claim 184 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

199. The medical implant of claim 185 wherein said keratin comprises high molecular weight keratin (HMWK) having a molecular weight of from about 50 to about 85 kDa.

200. The medical implant of claim 161 wherein the substrate comprises one or more biocompatible material is selected from the group consisting of silicon, metals, metal alloys, and ceramics.

201. The medical implant of claim 161 wherein said biocompatible material is selected from the group consisting of titanium and hydroxyapatite.

202. The medical implant of claim 161 wherein said biocompatible material comprises silicon.

203. The medical implant of claim 164 wherein the substrate comprises one or more biocompatible material is selected from the group consisting of silicon, metals, metal alloys, and ceramics.

204. The medical implant of claim 164 wherein said biocompatible material is selected from the group consisting of titanium and hydroxyapatite.

205. The medical implant of claim 164 wherein said biocompatible material comprises silicon.

206. The medical implant of claim 176 wherein the substrate comprises one or more biocompatible material is selected from the group consisting of silicon, metals, metal alloys, and ceramics.

207. The medical implant of claim 176 wherein said biocompatible material is selected from the group consisting of titanium and hydroxyapatite.

208. The medical implant of claim 176 wherein said biocompatible material comprises silicon.

209. The medical implant of claim 184 wherein the substrate comprises one or more biocompatible material is selected from the group consisting of silicon, metals, metal alloys, and ceramics.

210. The medical implant of claim 184 wherein said biocompatible material is selected from the group consisting of titanium and hydroxyapatite.

211. The medical implant of claim 184 wherein said biocompatible material comprises silicon.

212. The medical implant of claim 185 wherein the substrate comprises one or more biocompatible material is selected from the group consisting of silicon, metals, metal alloys, and ceramics.

213. The medical implant of claim 185 wherein said biocompatible material is selected from the group consisting of titanium and hydroxyapatite.

214. The medical implant of claim 185 wherein said biocompatible material comprises silicon.

215. The medical implant of claim 198 wherein the substrate comprises one or more biocompatible material is selected from the group consisting of silicon, metals, metal alloys, and ceramics.

216. The medical implant of claim 198 wherein said biocompatible material is selected from the group consisting of titanium and hydroxyapatite.

217. The medical implant of claim 198 wherein said biocompatible material 2.

218. The medical implant of claim 199 wherein the substrate comprises one or more biocompatible material is selected from the group consisting of silicon, metals, metal alloys, and ceramics.

219. The medical implant of claim 199 wherein said biocompatible material is selected from the group consisting of titanium and hydroxyapatite.

220. The medical implant of claim 199 wherein said biocompatible material comprises silicon.